California Energy Commission

Overview of Southern California Electricity Infrastructure Issues

Joint CEC/CPUC Workshop

Los Angeles

July 15, 2013

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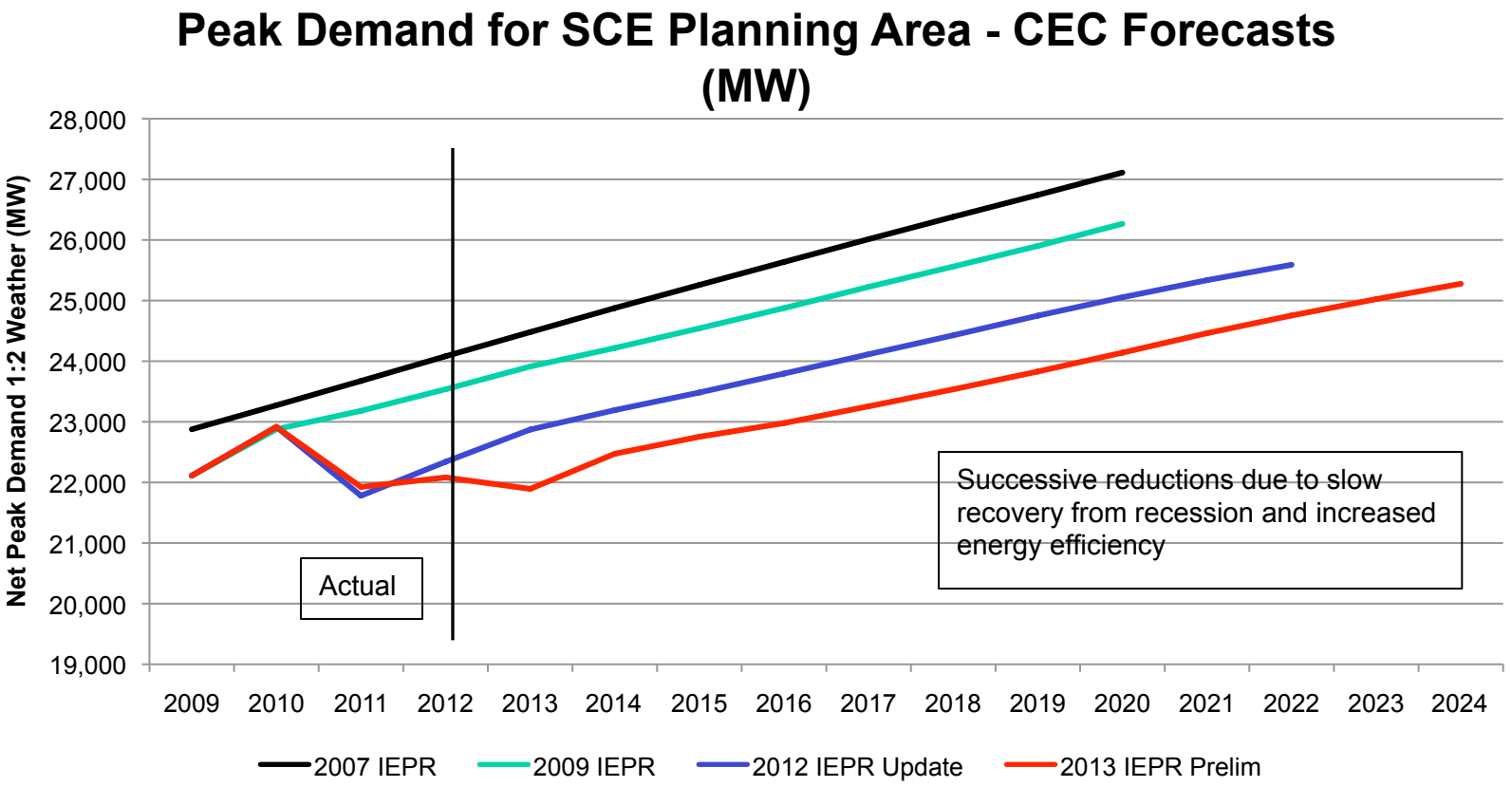
Why Are We Here?

- Southern California has faced unique challenges, but they are exacerbated by SONGS retirement
- Electricity infrastructure planning is balancing pursuit of public policy goals with evolving understanding of reliability standards
- Multiple agencies have independent authority to act on portions of the puzzle, but not all of it
- Sunshine thinking of the Governor's Task Force
- Receive feedback from panel and public

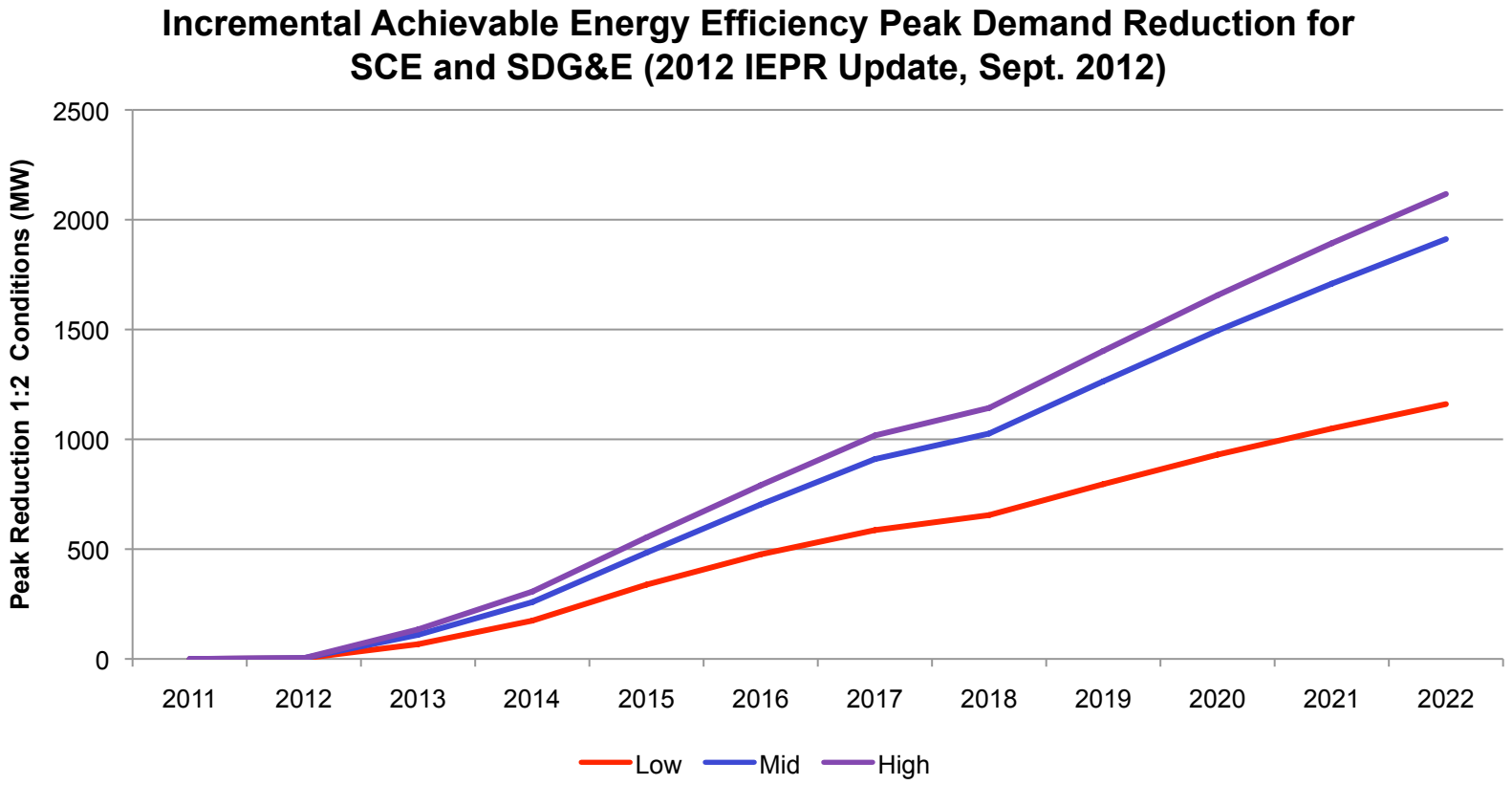
Fundamental Forces Driving Results

- Load growth supporting economic expansion
- Demand-side Policies (energy efficiency, demand response, and development of CHP) moderate demand / augment supply)
- Retirements as a result of an aging fossil fleet, SWRCB OTC policy and SONGS issues
- Renewable generation development
  - RPS mandate - achieve 33% of energy use by 2020
  - Governor Brown's 12,000MW DG goal (local PV)
- Constraints on choices:
  - Emission offsets are scarce and expensive
  - NERC/WECC/ISO reliability standards

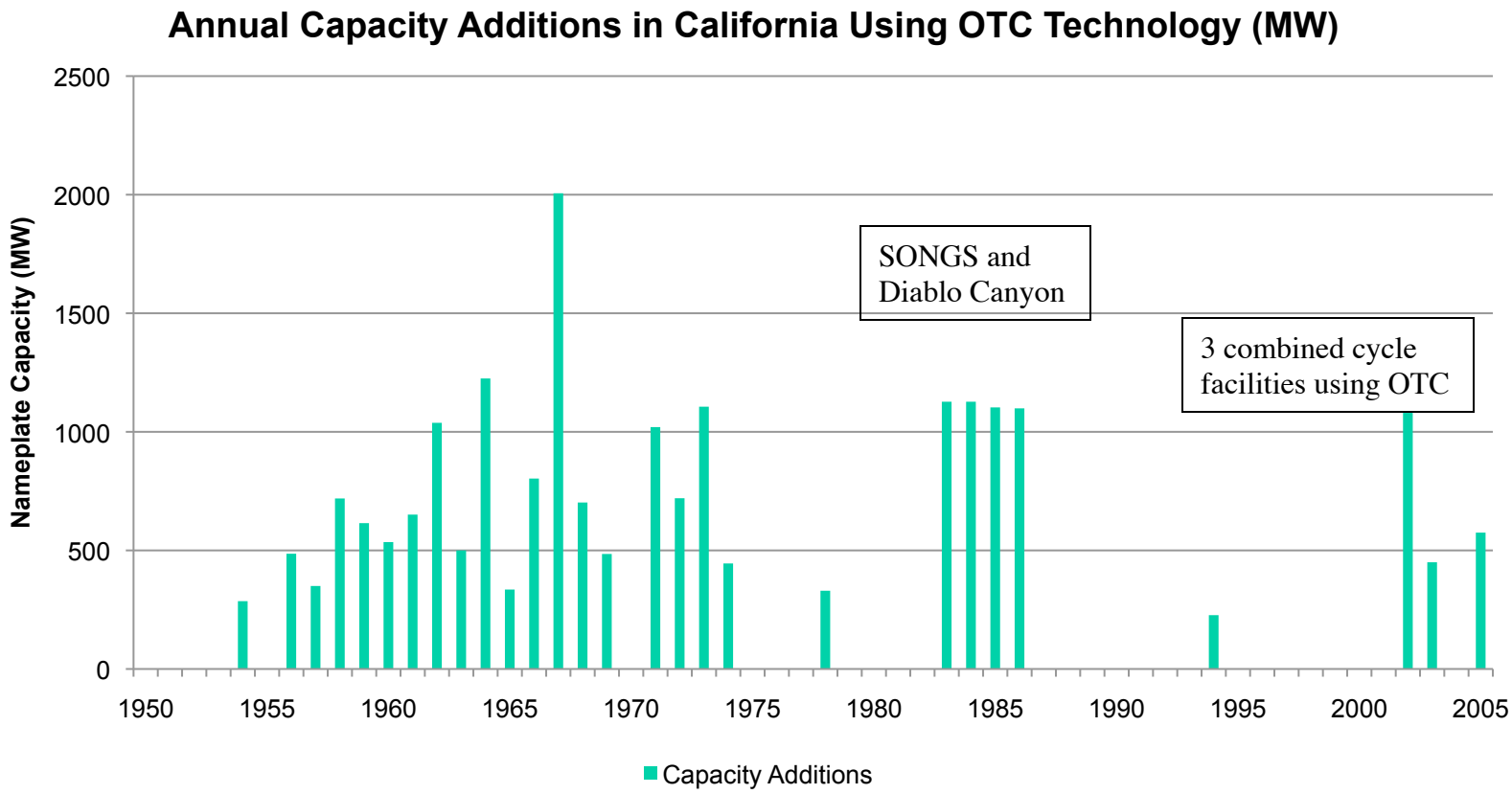
Evolving Demand



Additional Energy Efficiency



OTC Capacity is Aging



Impact of OTC Policy

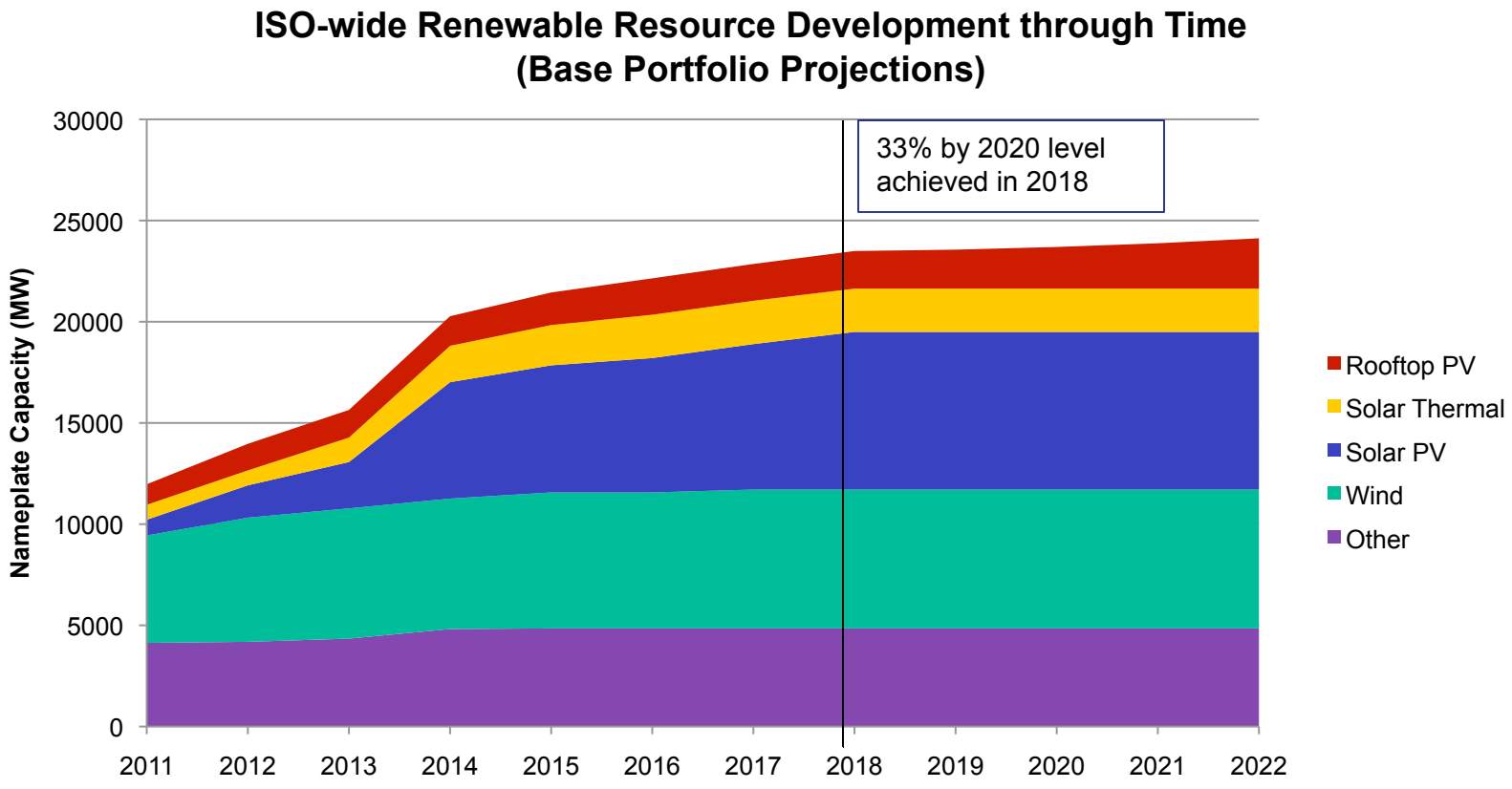
- - - - operating - - - - -

Pittsburg (2017)
Moss Landing (2017)
Morro Bay (2015)
Diablo Canyon (2024)
Mandalay (2020)
Ormond Bch (2020)
El Segundo 4 (2015)
Scattergood (2015, 24)
Redondo Bch (2020)
Harbor (2029)
Alamitos (2020)
Haynes (2013, 2029)
Huntington Bch 1-2 (2020)
Encina (2017)

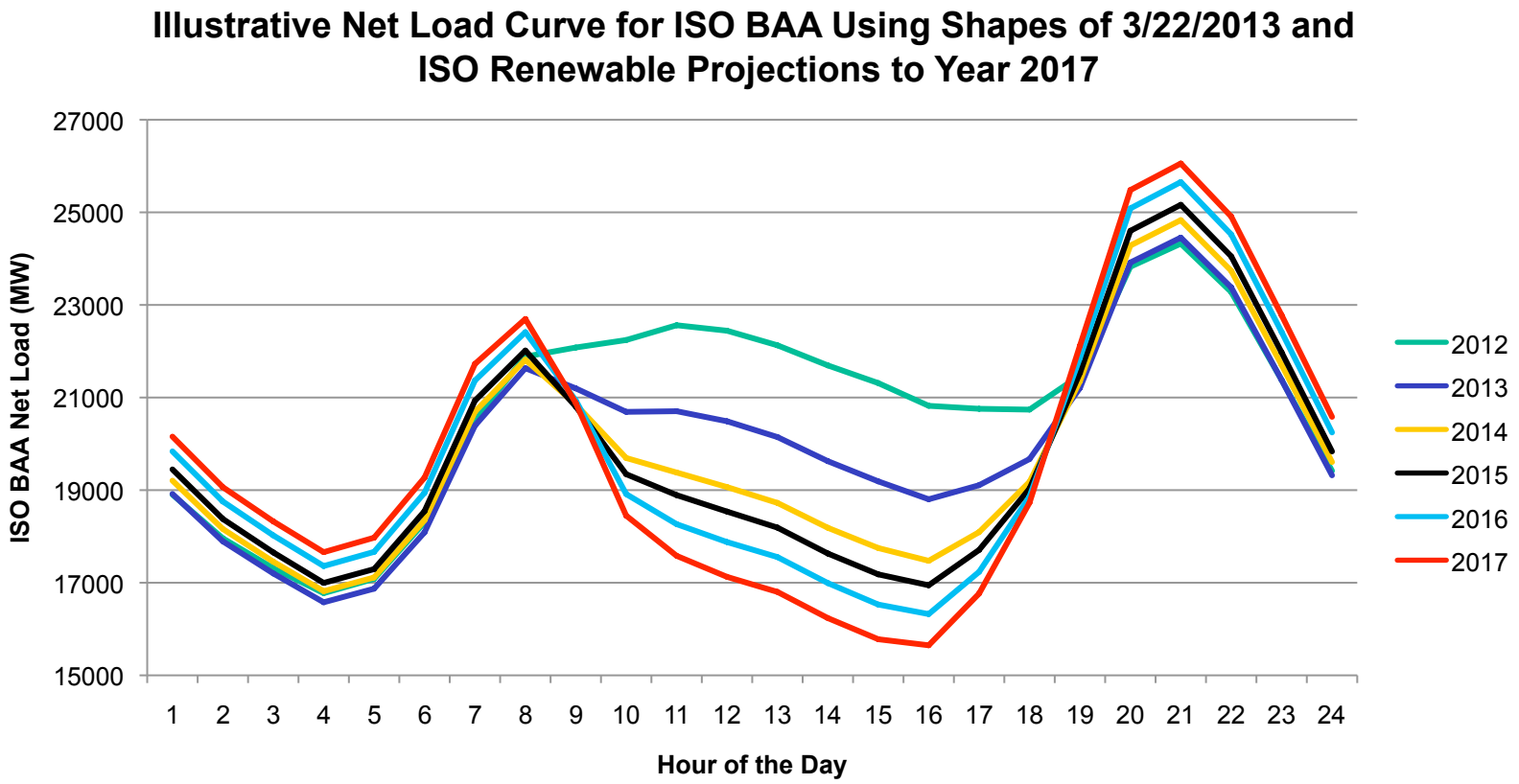
- - - - - retired - - - - - -

Humboldt Bay (2010)
Contra Costa (2013)
Potrero (2010)
El Segundo 3 (2013)
Huntington Bch 3-4 (2012)
San Onofre (2022)
South Bay (2010)

Renewable Development



Intermittent Renewable Challenges



Geography Issues

- ISO local capacity studies w/o SONGS have revealed strong interaction between LA Basin and San Diego:
  - Less generation in San Diego, means more in LA Basin
  - More generation in LA Basin, means less in San Diego
  - Many transmission options are from SCE to SDG&E
- Repowering OTC units in Ventura/Big Creek isn't needed for LCR, doesn't help satisfy LA Basin LCR, but could replace energy lost from SONGS
- South Coast, San Diego and Ventura are different air quality districts with different rules, offset availability, and attainment status
- Unknown amount of flexible capacity is needed in SP26

Air Quality Issues

- SCAB has severe attainment issues
- ERCs for key criteria pollutants are scarce/costly
- SCAQMD Rule 1304(a)(2)
  - Power plant developers do not have to provide offsets if capacity of steam boilers is replaced by equal or lesser capacity of advanced gas turbines
  - District satisfies federal NSR by debiting credits in its internal bank pursuant to Rule 1315
- Proposed Rule 1304.1 would impose fees
- Rule 1325 for $PM_{2.5}$ may constrain large facilities

Unique Influence of SONGS

- Located within local reliability area
- Integral to system stability at the interface between SCE and SDG&E systems; especially voltage instability
- SONGS retirement has greater impacts on SDG&E and southern Orange County than SCE as a whole
- Produced baseload energy with an average 82% annual capacity factor for 2001-2011

Infrastructure Assessments

- Types of studies:
  - Local reliability for transmission constrained areas
  - System stability (voltage/frequency)
  - System operating flexibility
  - System/zonal capacity balance, e.g. 15% planning reserve margin at system peak load
  - Select lesser cost resource mix to satisfy end-user energy requirements
- Satisfy air quality and water quality standards and policies

Recent Analytic Studies

- ISO 2011-12 TPP - pioneer 10-year LCR study
- ISO 2012-13 TPP local capacity studies define requirements within transmission constrained areas under SONGS out and OTC retirement conditions
- ISO studies of operating flexibility for CPUC LTPP may increase resource need in SCAB
- ISO and LADWP extended regular planning studies to support the AB 1318 project
- SCE and SDG&E analyses of SONGS issues

Analytic Challenges

- Assimilate results, inputs and methods of studies
- Reconcile local, zonal and system reliability; operating flexibility; and cost minimization studies
  - May have local needs when there is zero system need
  - The same resource may satisfy two roles
- Provide decision-makers with an understanding of the "range" within which policy judgments can be made without invalidating the technical results
- What physical or policy contingencies are not accounted for in studies?

Remaining Challenges

- Evaluate transmission system options
- Assess electrification and other energy impacts expected from SCAQMD's recent AQMP
- Understand how SCAQMD's rules and air quality attainment strategy will affect fossil development
- Assure that generation procurement processes fully address need for system, local and flexible resources at a affordable cost for ratepayers and with sustainable revenues for generators
- Continue resource procurement even though information is imperfect